

Banisteria, Number 23, 2004
© 2004 by the Virginia Natural History Society

OCCURRENCE OF INTRADERMAL MITE, *HANNEMANIA* SP. (ACARINA: TROMBICULIDAE), PARASITES IN TWO SPECIES OF AMPHIBIANS IN VIRGINIA—Chiggers, or trombiculid mites, are ectoparasites of a wide array of vertebrates, including amphibians and reptiles. Common ectoparasites apparently restricted to frogs and salamanders are species of the trombiculid mite genus *Hannemania* (Loomis, 1956). Host integument tissue is invaded by the larvae of this genus where they insert their mouthparts into the skin and form small red pustules that are visible to the naked eye. Reported amphibian hosts include species in the frog genera *Bufo*, *Gastrophryne*, *Hyla*, *Pseudacris*, *Rana*, and *Scaphiopus* and the salamander genera *Ambystoma*, *Desmognathus*, *Eurycea*, and *Plethodon* (Regeister, 2001). *Hannemania* parasites have been reported from *Rana catesbeiana*, *R. clamitans*, *R. palustris*, and *R. sphenoccephala* from North Carolina (Brandt, 1936; Murphy, 1965). Rankin (1937) reported chiggers on *Ambystoma maculatum*, *A. opacum*, *Eurycea guttolineata*, and *Plethodon glutinosus* from North Carolina. The only report of chiggers on amphibians from Virginia is by Loomis (1956), who reported *Rana clamitans* and *R. palustris* as hosts. This paper reports recent observations of *Hannemania* sp. parasitism on one salamander species and a frog from two locations in Virginia.

A juvenile (47 mm SVL) *Rana palustris* (pickerel frog) with chiggers was found in a spring box on 4 October 2003 at the Chancellorsville Battlefield, 12.6 km W Fredericksburg, in the Fredericksburg/Spotsylvania National Military Park, Spotsylvania County, Virginia by Will Brown and Lenny Leta. Dissection of one red pustule revealed a larval chigger inside. In total, 13 chiggers occurred on the inside of the right thigh, eight in the inside of the left thigh, and four on the rear thigh near the cloaca. Two other juvenile *R. palustris* were captured, as well as a juvenile *Rana clamitans* and three *Pseudotriton ruber* larvae. None of these specimens had chiggers. Amphibian specimens were donated to the National Park Service (Shenandoah National Park, Herpetological Collection). Murphy (1965) reported a prevalence of 78% in a sample of 201 *R. palustris* from North Carolina. McAllister et al. (1995) reported chigger mites on pickerel frogs from Arkansas. Loomis (1956) had previously reported *Hannemania dunni* larvae in this frog from Virginia but did not note a specific locality. The occurrence of this parasite in Spotsylvania County forms the second report of chigger mites on *Rana palustris* from Virginia.

On 15 August 2002 and 10 September 2003, C. Todd Georgel found single individuals of *Eurycea cirrigera* (southern two-lined salamander) with red pustules identical to those observed in the *Rana palustris* likely containing *Hannemania* sp. in Fort Lee, Prince George County, Virginia. The former was a juvenile (29 mm SVL, 32 mm tail length) caught under a rock in a tributary leading to Bailey's Creek with at least nine red pustules. They were located as follows: one on the right neck, one on the right lateral side behind the right forelimb, one on the left upper arm, one just anterior to the right rear limb insertion, two above the right limb insertion, two on the right foot, and one on the distal third of the tail. On the latter date he caught a male salamander (37 mm SVL, 42 mm tail length) under a log in the Bailey's Creek watershed in mixed hardwood forest with a total of eight chigger mites. These occurred as follows: one on each forearm, one 1 mm anterior of the left forearm on the neck, one on the posterior surface of the right thigh, one inside the right thigh, two near the right knee, one on the left forefoot, and one on the base of the tail 3 mm posterior to the right rear leg. Both specimens were released. *Hannemania* parasitism has only been reported previously for *E. cirrigera* in Tennessee by Regeister (2001). He found a prevalence of 48.7% infestation (1-24 per individual) in a sample of 158 salamanders. The Virginia observations expand the known geographic range of chigger mite parasitism in the Southern Two-lined Salamander.

Rankin (1937) suggested that *Hannemania* parasitism in amphibians was limited to those species that used terrestrial habitats for long periods of time. Both *Eurycea cirrigera* and *Rana palustris* occur frequently in leaf litter and under surface objects well away from water (Conant & Collins, 1998; Petranka, 1998; pers. obs.). The low occurrence of chiggers in more aquatic frogs such as *Rana catesbeiana* and *R. clamitans* suggests that they are usually not terrestrial long enough for larval mites to attach to a host, resulting in low prevalence (Murphy, 1965). It would be instructive to compare chigger mite prevalence in large samples of Virginia amphibians to test this hypothesis.

The specific identification of chigger mite parasites on amphibians is hindered by the fact that the infective life history stage is the larva (McAllister et al., 1995). Hyland (1956), Loomis (1956), and Murphy (1965), however, identified the chigger in amphibian specimens from North Carolina and Virginia as *Hannemania dunni*. Although it may be that the parasites on the two amphibians reported here represent a different species, it is also possible given the geographic proximity of the work in North Carolina and Loomis' identification in

Virginia that the parasite is *H. dumni*. It remains clear, however, that more detailed studies of chigger mite parasitism in these vertebrates in Virginia need to be undertaken.

ACKNOWLEDGMENTS

I thank Will Brown and C. Todd Georgel for assistance in the field. These observations were supported by contracts from Fort Lee through AH Environmental Consultants, Inc. and the U.S. National Park Service.

LITERATURE CITED

- Brandt, B. B. 1936. Parasites of certain North Carolina salientia. *Ecological Monographs* 6: 493-532.
- Conant, R., & J. T. Collins. 1998. *A Field Guide to Reptiles & Amphibians of Eastern and Central North America*. Third expanded edition. Houghton Mifflin Co., Boston, MA. 616 pp.
- Hyland, K. E. 1956. A new species of chigger mite, *Hannemania hegeneri* (Acarina: Trombiculidae). *Journal of Parasitology* 42: 176-179.
- Loomis, R. B. 1956. The chigger mites of Kansas. *University of Kansas Science Bulletin* 37: 1195-1443.
- McAllister, C. T., S. E. Trauth, & C. R. Bursey. 1995. Parasites of the pickerel frog, *Rana palustris* (Anura: Ranidae), from the southern part of its range. *Southwestern Naturalist* 40: 111-116.
- Murphy, T. D. 1965. High incidence of two parasitic infestations and two morphological abnormalities in a population of the frog *Rana palustris* Le Conte. *American Midland Naturalist* 74: 233-239.
- Petranka, J. W. 1998. *Salamanders of the United States and Canada*. Smithsonian Institution Press, Washington, DC. 587 pp.
- Rankin, J. S. 1937. An ecological study of some North Carolina salamanders. *Ecological Monographs* 7: 169-269.
- Regester, K. J. 2001. Intra-dermal mite, *Hannemania* sp. (Acarina: Trombiculidae), infestations differ in populations of syntopic plethodontids in central Tennessee. *Herpetological Natural History* 8: 69-73.

Joseph C. Mitchell
 Department of Biology
 University of Richmond
 Richmond, Virginia 23173